

CLAIMS

1. A surface acoustic wave branching filter comprising:

a first surface acoustic wave filter having a relatively low passband;

a second surface acoustic wave filter having a relatively high passband; and

a first common terminal to which one end of each of the first and second surface acoustic wave filters is connected and which is connected to an antenna,

wherein the first surface acoustic wave filter is a surface acoustic wave filter of a ladder-type circuit structure having a plurality of parallel-arm resonators and a plurality of series-arm resonators, and

wherein among the pluralities of series-arm resonators and parallel-arm resonators, a resonator being the closest to the first common terminal is a parallel-arm resonator and the capacitance of the parallel-arm resonator being the closest to the first common terminal is less than $1/2$ of the capacitance of another parallel-arm resonator, different from the parallel-arm resonator, sandwiched between series-arm resonators.

2. A surface acoustic wave branching filter as claimed in claim 1, wherein the capacitance of the parallel-arm resonator being the closest to the first common terminal is in the range of $1/40$ to $1/5$ of the capacitance of the other parallel-arm resonator sandwiched between different series-arm resonators.

3. A surface acoustic wave branching filter as claimed in claim 1 or 2, further comprising:

a second common terminal to which one end of the parallel-arm resonator being the closest to the first common terminal and one end of the other parallel-arm resonator are connected, and

an inductance element disposed between the second common terminal

and the ground potential.

4. A surface acoustic wave branching filter as claimed in claim 3, further comprising:

a package material housing the first and second surface acoustic wave filters, wherein the second common terminal is included in the package.

5. A surface acoustic wave branching filter as claimed in any one of claims 1 to 4, wherein the resonance frequency of the parallel-arm resonator being the closest to the first common terminal is substantially the same as the resonance frequency of the other parallel-arm resonator.

6. A surface wave branching filter as claimed in any one of claims 1 to 5, further comprising:

a phase adjustment element inserted between the second surface acoustic wave filter and the first common terminal.

7. A surface acoustic wave branching filter as claimed in claim 6, wherein the amount of phase delay of the phase adjustment element is less than 90 degrees from the central frequency of the first surface acoustic wave filter and, when seen from the side of the first common terminal, at least 50% of the passband of the second surface acoustic wave filter is inductive.

8. A surface acoustic wave branching filter as claimed in claim 6 or 7, wherein the phase adjustment element is a stripline.

9. A surface acoustic wave branching filter as claimed in claim 6 or 7, wherein the phase adjustment element comprises a capacitance element and a second inductance element.

10. A surface acoustic wave branching filter as claimed in any one of claims 6 to 9, wherein, when seen from the side of the first common terminal, at least 50% of the passband of the second surface acoustic wave filter is inductive.